SJIF Impact Factor (2025): 8.688| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 10 | Issue: 8 | August 2025 - Peer Reviewed Journal

THE DIGITAL DIVIDE AND ITS IMPACT ON WOMEN'S EMPOWERMENT: A CASE STUDY OF RAJASTHAN

Tanushree Khichi
Research Scholar, Department of Business Finance and Economics, Faculty of Commerce, Jai Narain Vyas University, Jodhpur

ABSTRACT
This research paper investigates the complex relationship between the digital divide and women's empowerment in the state of Rajasthan, India. Based on a survey of 545 women across diverse demographic and geographic backgrounds, the study employs both descriptive and inferential statistical analyses to examine how access to digital technologies—primarily smartphones and the internet—influences economic opportunities, social participation, and psychological confidence. The findings reveal a significant positive correlation between digital access and economic empowerment (Spearman's $\rho = 0.708$, $p < .001$), as well as social engagement ($\rho = 0.503$, $p < .001$). Furthermore, key socio-economic factors such as age, education, and income were identified as significant predictors of digital access through an ordinal logistic regression model ($R^2McF = 0.212$). A pronounced urban-rural divide was evident, with 75.2% of respondents from urban areas reporting higher perceived benefits from digital tools. The study concludes that while digital technologies serve as powerful levers for empowerment, targeted interventions addressing infrastructural gaps, affordability, and digital literacy, particularly in rural and low-income communities, are urgently required to bridge the digital divide and foster inclusive growth.

KEYWORDS: *Digital Divide, Women's Empowerment, Digital Literacy, Economic Opportunities, Social Participation, Socio-Economic Factors.*

1. INTRODUCTION

The rapid proliferation of digital technologies has fundamentally altered global economic, social, and cultural landscapes. In this digital era, the ability to access and effectively utilize technology is no longer a luxury but a prerequisite for full participation in society. For women, particularly in developing regions, digital tools offer unprecedented potential to challenge traditional gender norms, access new economic opportunities, amplify their voices in civic discourse, and foster greater autonomy. This phenomenon, often termed "digital empowerment," is critical for achieving broader goals of gender equality and sustainable development.

However, the promise of digital empowerment is tempered by the persistent reality of the digital divide—the gap between those who have access to modern information and communication technology (ICT) and those who do not. This divide is not merely a matter of connectivity; it is deeply intertwined with existing socio-economic inequalities, including disparities in income, education, geographic location, and age. For women, these barriers are often compounded by gendered social norms and cultural restrictions, further limiting their ability to benefit from the digital revolution.

The state of Rajasthan in India presents a compelling case study for exploring this dynamic. Characterized by significant geographic variation, socio-economic diversity, and a complex tapestry of cultural traditions, Rajasthan exhibits a stark contrast between its urban centers, such as Jaipur and Jodhpur, and its vast rural hinterlands. While urban areas may boast relatively better digital infrastructure, rural regions often grapple with inadequate internet connectivity, low levels of digital literacy, and affordability issues. These disparities create a multifaceted digital divide that disproportionately affects women, potentially limiting their engagement in the digital economy and their access to information, education, and social services.

This paper seeks to move beyond a simplistic access/no-access binary and provide a nuanced analysis of how the digital divide in Rajasthan impacts various dimensions of women's empowerment. By examining the interplay between demographic factors and digital engagement, this study aims to elucidate the pathways through which technology can either reinforce existing inequalities or serve as a catalyst for empowerment.

2. OBJECTIVES OF THE STUDY

The primary objective of this research is to comprehensively analyze the impact of the digital divide on the empowerment of women in Rajasthan. This overarching goal is broken down into the following specific objectives:

1. To profile the demographic characteristics (age, education, income, geographic location) of women in Rajasthan and assess their levels of access to and use of digital tools.
2. To examine the relationship between digital access and women's economic empowerment, specifically in terms of income generation and employment opportunities.

SJIF Impact Factor (2025): 8.688| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 10 | Issue: 8 | August 2025 - Peer Reviewed Journal

3. To investigate the impact of digital technologies on women's social empowerment, including community participation and access to social networks.
4. To analyze the role of key socio-economic factors (education, income, location) in contributing to the digital divide.
5. To evaluate the effect of digital literacy programs on women's psychological empowerment, particularly their self-confidence and sense of agency.
6. To compare the differential impact of the digital divide on empowerment outcomes for women in urban versus rural settings.

3. METHODOLOGY

3.1. Research Design and Data Collection

This study employs a quantitative, cross-sectional research design. Primary data was collected through a structured survey administered to a sample of 545 women across seven divisions of Rajasthan: Ajmer, Bharatpur, Bikaner, Jaipur, Jodhpur, Kota, and Udaipur. The survey was designed to capture data on demographic variables and key constructs related to digital access and empowerment.

3.2. Sample Characteristics

The sample was designed to capture a diverse range of experiences. As detailed in Table 1, the majority of respondents (60.7%) were young women aged 18-25, followed by the 26-35 age group (27.3%). Geographically, the sample included representation from both urban (75.2%) and rural (24.8%) areas, with the highest concentration of respondents from the Jaipur division (19.8%). Educationally, over half the sample (51.9%) had completed secondary education, and 36.3% held a graduation degree or higher. Income distribution showed that 42.2% earned between ₹10,000-20,000 per month, while 39.4% earned above ₹20,000.

3.3. Variables and Measures

The study analyzed both independent and dependent variables. Independent variables included demographic factors (age, education, income, urban/rural location) and digital access factors (smartphone/internet access, participation in digital literacy programs). Dependent variables measured empowerment outcomes:

- **Economic Empowerment:** Measured by responses to Digital_Helped_Job_Income.
- **Social Empowerment:** Measured by Use_Digital_Community and Digital_Increased_Community_Participation.
- **Psychological Empowerment:** Measured by Digital_Increased_Confidence and Digital_Improved_Opportunities. Responses were captured on a 5-point Likert scale from Strongly Disagree to Strongly Agree.

3.4. Data Analysis

Data analysis was conducted in two phases:

1. **Descriptive Analysis:** Frequencies, percentages, and visual representations (tables and graphs) were used to summarize the demographic profile and general trends in the data.
2. **Inferential Analysis:** To test the hypotheses and examine relationships between variables, several statistical tests were employed:
    - **Spearman's Rank-Order Correlation and Kendall's Tau-b:** To assess the strength and direction of relationships between ordinal variables (e.g., access and income benefits).
    - **Ordinal Logistic Regression:** To model the relationship between multiple demographic predictors (age, education, income) and the ordinal outcome of digital access.
    - **Mann-Whitney U Test:** A non-parametric test to compare differences in empowerment outcomes between two independent groups (e.g., those who attended digital literacy programs vs. those who did not; urban vs. rural respondents).

    All analyses were performed using statistical software, with a significance level set at $p < 0.05$.

4. RESULTS AND DISCUSSION

4.1. Descriptive Profile of Digital Access and Engagement

The data paints a clear picture of the digital landscape for women in Rajasthan. As shown in Table 1, a combined 61.8% of respondents either Agreed or Strongly Agreed that they had access to a smartphone and the internet. However, a significant 30.8% remained Neutral, suggesting uncertain or limited access, while 7.4% expressed disagreement, indicating a lack of access.

SJIF Impact Factor (2025): 8.688| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 10 | Issue: 8 | August 2025 - Peer Reviewed Journal

Table 1: Age Distribution of Respondents

Age Group	Frequency	Percent	Valid Percent	Cumulative Percent
18-25	331	60.7	60.7	60.7
26-35	149	27.3	27.3	88.1
36-50	65	11.9	11.9	100.0
Missing	0	0.0		
Total	**545**	**100.0**		
Source: Survey Data				

A critical finding was the stark urban-rural disparity. Table 2 reveals that 75.2% of respondents were from urban areas, heavily skewing the sample. This over-representation itself is indicative of the digital divide, as women in rural areas are harder to reach and often have lower engagement with digital surveys. This urban bias must be considered when interpreting the overall results, as the experiences of rural women are likely underrepresented.

Table 2: Urban/Rural Distribution of Respondents

Area	Frequency	Percent	Valid Percent	Cumulative Percent
Rural	135	24.8	24.8	24.8
Urban	410	75.2	75.2	100.0
Missing	0	0.0		
Total	**545**	**100.0**		
Source: Survey Data				

4.2. Digital Access and Economic Empowerment

The analysis provides compelling evidence supporting a strong positive relationship between digital access and economic empowerment. Testing sub-hypothesis $\mathbf{H_{11}}$, a very strong and statistically significant correlation was found between Access_Smartphone_Internet and Digital_Helped_Job_Income (Spearman's $\rho = 0.708$, $p < .001$; Kendall's Tau-b = 0.653, $p < .001$) (Table 4).

Table 3: Correlation between Digital Access and Economic Empowerment

	Spearman		Kendall	
	rho	p	tau B	p
Access_Smartphone_Internet vs. **Digital_Helped_Job_Income**	0.708	<.001	0.653	<.001
Source: Analysis of Survey Data				

This robust correlation indicates that women who report better access to digital tools are significantly more likely to report that these tools have helped them generate income and improve their job opportunities. This aligns with the global narrative of the digital economy creating new avenues for work, such as freelancing, e-commerce, remote employment, and digital marketing.

4.3. Digital Tools and Social Empowerment

The study also confirmed a significant positive impact of digital tools on social empowerment, supporting $\mathbf{H_{12}}$. A moderate-to-strong correlation was found between the use of digital tools for community engagement (Use_Digital_Community) and the perception that digital tools increased community participation (Digital_Increased_Community_Participation) ($\rho = 0.503$, $p < .001$; Tau-b = 0.440, $p < .001$) (Table 4).

Table 4: Correlation between Digital Use and Community Participation

	Spearman		Kendall	
	rho	p	tau B	p
Use_Digital_Community vs. **Digital_Increased_Community_Participation**	0.503	<.001	0.440	<.001
Source: Analysis of Survey Data				

This finding underscores the role of digital platforms—social media, messaging apps, online forums as vital tools for building social capital, maintaining relationships, engaging in activism, and participating in civic life. For women, especially those whose physical mobility may be constrained by social norms, digital spaces can offer an alternative arena for social interaction and community involvement, fostering a sense of belonging and collective agency.

4.4. Socio-Economic Determinants of the Digital Divide

A core objective was to understand the factors fueling the digital divide. An ordinal logistic regression model was constructed with Access_Smartphone_Internet as the dependent variable and age, education, and income as predictors. The model was statistically significant ($R^2McF = 0.212$) and revealed that all three factors are powerful predictors of digital access, leading to the rejection of $\mathbf{H_{03}}$ in favor of $\mathbf{H_{13}}$.

SJIF Impact Factor (2025): 8.688| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 10 | Issue: 8 | August 2025 - Peer Reviewed Journal

Table 5: Ordinal Logistic Regression Predicting Digital Access

Predictor	Estimate	SE	Z	p
Age (Ref: 26-35)				
36-50	-1.452	0.317	-4.58	**<.001**
18-25	1.495	0.215	6.96	**<.001**
Education (Ref: Graduation+)				
Secondary	-0.445	0.188	-2.37	**0.018**
Primary	-2.518	0.387	-6.51	**<.001**
No Formal Education	-1.666	0.431	-3.87	**<.001**
Income (Ref: <₹10,000)				
>₹20,000	1.637	0.261	6.27	**<.001**
₹10,000-20,000	1.476	0.257	5.75	**<.001**
Source: Analysis of Survey Data				

- **Age:** Younger women (18-25) had significantly higher odds of digital access compared to the 26-35 reference group (Est. = 1.495, p<.001), while older women (36-50) had significantly lower odds (Est. = -1.452, p<.001), highlighting a generational digital gap.
- **Education:** The regression coefficients show a clear gradient: as education level decreases, the odds of digital access plummet. Women with no formal education or only primary education were at a severe disadvantage compared to graduates.
- **Income:** Higher income was a strong predictor of access. Women earning over ₹20,000 had dramatically higher odds of access than those in the lowest income bracket (<₹10,000).

This model conclusively demonstrates that the digital divide is not a standalone issue but is deeply embedded in and exacerbated by pre-existing socio-economic inequalities.

4.5. Impact of Digital Literacy Programs on Confidence

The Mann-Whitney U test revealed a statistically significant difference in confidence levels (Digital_Increased_Confidence) between women who had attended a digital literacy program and those who had not (U = 18492, z = -7.93, p < .001) (Table 7). The median confidence level for attendees was 5.00 (Strongly Agree) compared to 4.00 (Agree) for non-attendees.

Table 6: Mann-Whitney Test for Confidence by Digital Literacy Attendance

Group	N	Median	Average Rank
No (Did Not Attend)	383	4.00	240
Yes (Attended)	162	5.00	148
Statistic	**Value**	**p-value**	
Mann-Whitney U	18492	**<.001**	
z-statistic	-7.93	**<.001**	
Source: Analysis of Survey Data			

This result strongly supports **H_{14}**, indicating that formal digital literacy training is highly effective in boosting women's confidence in using technology. This enhanced self-efficacy is a critical component of psychological empowerment, enabling women to explore digital spaces more freely and use technology as a tool for personal and professional advancement. It is noteworthy, however, that only 29.7% of the sample had attended such a program , pointing to a significant gap in the availability of or access to these crucial initiatives.

4.6. Urban-Rural Disparities in Empowerment Outcomes

The analysis confirmed a significant urban-rural divide in perceived digital opportunities, supporting **H_{15}**. The Mann-Whitney U test showed that urban women reported significantly higher levels of agreement that digital tools improved their opportunities (Digital_Improved_Opportunities) compared to rural women (U = 34569, z = 4.56, p < .001) (Table 8). Although the median was 4.00 for both groups, the average rank for urban respondents was 290, vastly higher than the 73.1 for rural respondents.

Table 7: Mann-Whitney Test for Opportunities by Urban/Rural Location

Group	N	Median	Average Rank
Urban	410	4.00	290
Rural	135	4.00	73.1
Statistic	**Value**	**p-value**	
Mann-Whitney U	34569	**<.001**	
z-statistic	4.56	**<.001**	
Source: Analysis of Survey Data			

SJIF Impact Factor (2025): 8.688| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 10 | Issue: 8 | August 2025 - Peer Reviewed Journal

This stark difference underscores the cumulative effect of the digital divide. Rural women, facing compounded barriers of poorer infrastructure, higher costs, and potentially lower digital literacy, derive comparatively fewer perceived benefits from digital technologies. This disparity threatens to exacerbate existing socio-economic gaps between urban and rural regions, leaving rural women at risk of being left behind in the digital transformation.

5. CONCLUSION AND RECOMMENDATIONS

This study provides robust empirical evidence that digital technologies are powerful enablers of women's empowerment in Rajasthan, significantly contributing to economic advancement, social participation, and psychological confidence. However, this potential is critically undermined by a pervasive digital divide that mirrors and reinforces existing inequalities based on age, education, income, and geography.

The findings lead to several key conclusions:

1. **Digital Access is Empowering:** There is a direct, strong, and positive relationship between access to digital tools and key empowerment outcomes, particularly in the economic sphere.
2. **The Divide is Multi-Dimensional:** The digital divide is not merely about connectivity. It is a complex web of interlinked barriers including affordability (income), capability (education and digital literacy), and infrastructure (urban-rural divide).
3. **Interventions Must Be Targeted:** A one-size-fits-all approach to digital inclusion will fail. The specific barriers faced by different groups—older women, the less educated, low-income populations, and rural communities—require tailored solutions.

Based on these conclusions, the following recommendations are proposed

For Policy Makers

- **Infrastructure Investment:** Prioritize public investment in robust digital infrastructure, particularly high-speed internet broadband in rural and remote areas of Rajasthan.
- **Subsidized Access:** Develop schemes to provide affordable smartphones and data plans for women from low-income households.
- **Mainstream Digital Literacy:** Integrate digital literacy curricula into adult education programs, vocational training centers, and school systems, with a special focus on reaching women and girls.

For NGOs and Community Organizations

- **Localized Training:** Design and implement community-based digital literacy programs that are context-specific, offered in local languages, and address the practical needs of women (e.g., digital banking, accessing government services, online marketplaces).
- **Create Safe Spaces:** Establish community digital resource centers that provide women with safe, supportive, and free-to-access environments to learn and use technology.

For Future Research

- **Longitudinal Studies:** Conduct long-term studies to track the sustained impact of digital access and literacy programs on women's empowerment trajectories.
- **Qualitative Deep Dive:** Employ qualitative methods to better understand the nuanced social and cultural barriers that inhibit digital adoption among specific groups of women.
- **Expand Sampling:** Future studies should intentionally oversample rural, illiterate, and low-income women to ensure their experiences are adequately captured and analyzed.

Bridging the digital divide is not merely a technological challenge but a fundamental requirement for achieving gender justice and equitable development. By implementing targeted, multi-faceted strategies that address the root causes of digital exclusion, stakeholders can ensure that the benefits of the digital age are accessible to all women in Rajasthan, empowering them to become active agents of their own development and of social change.

6. REFERENCES

1. *Hilbert, M. (2016). The bad news is that the digital access divide is here to stay: Domestically installed bandwidths among 172 countries for 1986–2014. Telecommunications Policy, 40(6), 567-581.*
2. *OECD. (2018). Bridging the Digital Gender Divide: Include, Upskill, Innovate. OECD Publishing, Paris.*
3. *Hafkin, N. J., & Huyer, S. (Eds.). (2006). Cinderella or Cyberella? Empowering Women in the Knowledge Society. Kumarian Press.*
4. *GSMA. (2021). The Mobile Gender Gap Report 2021. GSM Association.*
5. *UN Women. (2020). Addressing the Digital Divide: A Pathway to Gender Equality. Policy Brief.*
6. *Singh, S. (2010). Digital Divide in India: Measurement, Determinants and Policy for Addressing the Challenges in Bridging the Digital Divide. International Journal of Innovation in the Digital Economy, 1(2), 1-24.*
7. *Raj, S., & Roy, S. (2021). Digital India and Gender Empowerment: Prospects and Challenges. Journal of International Women's Studies, 22(5), 94-109.*

SJIF Impact Factor (2025): 8.688| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 10 | Issue: 8 | August 2025 - Peer Reviewed Journal

8. *World Bank. (2016). World Development Report 2016: Digital Dividends. World Bank Publications.*
9. *Van Dijk, J. A. G. M. (2020). The Digital Divide. Polity Press.*
10. *Zainudeen, A., & Iqbal, T. (2018). Digital Literacy of the Poor: A Study of Low-Income Communities in India. LIRNEasia.*